AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-54 (cancelled)

55. (currently amended) A method for producing carbon nanotubes from a gas phase, comprising:

~~producing~~ providing pre-made aerosol catalyst particles, said pre-made aerosol catalyst particles having been produced by a method selected from the group consisting of physical vapor nucleation of catalyst material ~~or by~~ and solution droplet thermal decomposition of catalyst precursor;

introducing said pre-made aerosol catalyst particles into a reactor;

introducing one or more carbon sources into the reactor; and

reacting said pre-made aerosol catalyst particles and said one or more carbon sources in [[a]] the reactor to produce carbon nanotubes.

56. (previously presented) The method according to claim 55, wherein the catalyst precursor and/or the catalyst material contains one or more metals.

57. (previously presented) The method according to claim 55, wherein the catalyst particles are formed due to the nucleation of supersaturated vapor wherein the vapor is evaporation from one or more resistively heated wires consisting of one or more metals or metal alloys, due to metal or alloy arc, spark or electrostatic discharge, due to evaporation from a conductively heated metal or alloy or due to evaporation from radiatively heated metal or alloy.

58. (previously presented) The method according to claim 57, wherein the supersaturation is created by means of gas cooling by convective, conductive and/or radiative heat transfer and/or adiabatic expansion.

59. (previously presented) The method according to claim 55, wherein the catalyst particles are produced before the synthesis of carbon nanotubes in the reactor.

60. (previously presented) The method according to claim 55, wherein the catalyst particles are classified according to one or more particle properties.

61. (previously presented) The method according to claim 60, wherein the catalyst particles are mobility-size classified, mass classified, solubility classified, reactivity

classified, inertially classified, thermophoretically classified, diffusionally classified, charge classified, crystalinity classified and/or gravitationally classified.

62. (previously presented) The method according to claim 60, wherein the catalyst particles are classified by a differential mobility analyzer or by a mass spectrometer.

63. (previously presented) The method according to claim 55, wherein the carbon source comprises a hydrocarbon.

64. (previously presented) The method according to claim 55, wherein the carbon source comprises methane, ethane, propane, acetylene, ethylene, benzene, toluene, o-xylene, p-xylene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, $C_{15}H_{32}$, $C_{16}H_{34}$, $C_{17}H_{36}$, $C_{18}H_{38}$, methanol, ethanol, propanol, butanol, pentanol, hexanol, heptanol, octanol, acetone, methyl ethyl ketone, formic acid, acetic acid and/or carbon monoxide.

65. (previously presented) The method according to claim 55, wherein the method further comprises using one or more reagents.

66. (previously presented) The method according to claim 65, wherein the reagent(s) is/are used for participation in

a chemical reaction with one or more catalyst particle precursors and/or with one or more catalyst particles and/or with one or more carbon sources and/or with amorphous carbon deposited on carbon nanotubes and/or with carbon nanotubes.

67. (previously presented) The method according to claim 65, wherein the chemical reaction of the reagent(s) with catalyst particle precursor and/or with pre-made particles is/are used for promotion of carbon nanotube formation and/or in that the chemical reaction of reagent(s) with amorphous carbon is/are used for carbon nanotube purification and/or in that the chemical reaction of reagent(s) with the carbon nanotubes is/are used for carbon nanotube functionalization and/or carbon nanotube doping.

68. (previously presented) The method according to claim 65, wherein the reagent is an alcohol, H_2, H_2O, NO, CO_2, PH_3 and/or NH_3.

69. (previously presented) The method according to claim 55, wherein the method further comprises the following step:

using one or more additives to produce a composite carbon nanotube formulation.

70. (previously presented) The method according to claim 55, wherein the residence time, temperature and/or catalyst particle properties and/or catalyst particle concentration and/or reagent concentration and/or carbon source concentration histories in one or more reactors are controlled.

71. (previously presented) The method according to claim 55, wherein there are two or more existing catalyst particle supplies which are composed of particles of essentially similar sizes, compositions, concentrations, states and/or morphologies or are composed of two or more distinct sizes, compositions, concentrations, states and/or morphologies.

72. (currently amended) An apparatus for producing carbon nanotubes from a gas phase, comprising:

a device configured to produce pre-made aerosol catalyst particles by a method selected from the group consisting of physical vapor nucleation of catalyst material ~~or by~~ and solution droplet thermal decomposition of catalyst precursor; and

one or more reactors for producing carbon nanotubes using said pre-made aerosol catalyst particles and one or more carbon sources, the one or more reactors being configured for the introduction of the pre-made catalyst particles, the introduction of the one or more carbon sources, and reacting the pre-made

catalyst particles and the one or more carbons sources to produce the carbon nanotubes.

73. (previously presented) The apparatus according to claim 72, wherein said device configured to produce said pre-made aerosol catalyst particles comprises one or more pre-reactors.

74. (previously presented) The apparatus according to claim 72, wherein said device configured to produce said pre-made aerosol catalyst particles comprises a hot wire generator.

75. (previously presented) The apparatus according to claim 72, wherein the apparatus further comprises one or more of the following:

one or more catalyst particle classifiers;

one or more carbon nanotube samplers;

one or more carbon nanotube classifiers;

one or more sources supplying energy to said device configured to produce said pre-made aerosol catalyst particles and/or to said reactor;

one or more devices configured for introducing one or more reagents and/or additives to the device configured to produce said pre-made aerosol catalyst particles and/or to the reactor;

one or more aerosol samplers and/or classifiers extracting all or part of the carbon nanotube aerosol flow;

one or more aerosol samplers and/or classifiers extracting all or part of a composite carbon nanotube aerosol flow.

76. (previously presented) The apparatus according to claim 72, wherein the surface of the reactor and/or the device configured to produce said pre-made aerosol catalyst particles contain material included in one or more catalyst particles or in that the surfaces of the reactor and/or the device configured to produce said pre-made aerosol catalyst particles are saturated with material included in one or more catalyst particles.

77. (previously presented) The apparatus according to claim 72, wherein there are two or more pre-reactors and said pre-reactors are operated in parallel and said parallel pre-reactors are operated at essentially similar conditions and/or with essentially similar materials so as to produce catalyst particles of essentially similar sizes, compositions, concentrations, states and/or morphologies or said parallel pre-reactors are operated at different conditions and/or with different materials and/or methods so as to produce catalyst particles of two or more distinct sizes, compositions, concentrations, states and/or morphologies.

78. (previously presented) The apparatus according to claim 72, wherein said reactors are operated in parallel and said parallel reactors are operated at essentially similar conditions and/or with essentially similar materials so as to produce carbon nanotubes with essentially similar length, diameter, morphology and/or chirality or said parallel reactors are operated at different conditions and/or with different materials and/or methods so as to produce carbon nanotubes with two or more distinct lengths, diameters, morphologies and/or chiralities.

79. (previously presented) The apparatus according to claim 72, wherein the reactor length, volume and/or wall temperature and/or the flow rate of carbon sources and/or reagents and/or carrier gases are configured to control the residence time and/or temperature history of catalyst particles and/or carbon nanotubes and/or composite carbon nanotubes in the reactor(s) and/or pre-reactor(s).

80-91. (canceled)